

extracted for 30 to 60 minutes in 0.5 per cent sodium desoxycholate saline solution. The resulting clear extract was precipitated by the addition of 3 to 4 volumes of ethyl alcohol. The initial precipitate was in the form of a fibrous mass floating to the surface of the alcohol, from which it could be lifted out with a spatula.

This initial crude product was deproteinized by the Sevag<sup>7</sup> chloroform method and freed from capsular polysaccharide by the addition of the Dubos bacterial enzyme.<sup>8</sup> This enzyme has the property of hydrolyzing type III capsular material. The resulting digest was again deproteinized to remove the added enzyme protein, and repeatedly reprecipitated by the addition of ethyl alcohol. The final yield was usually between 10 to 25 mg. per 75 liters of culture, representing the major part of the active principle originally present in the crude extract.

Titration showed that under the standard technique, 0.003 micrograms of this final product will bring about transformation of avirulent, unencapsulated R strains to fully virulent, capsulated *Pneumococcus* of type III. In this technique the active principle is effective in a concentration of 1:600,000,000.

Examinations by means of the analytical ultracentrifuge indicate that the substance is homogeneous with molecules of uniform size of the approximate order of 500,000. Elementary chemical and enzymatic analyses led to the conclusion that the "mutagen" is a type-specific nucleic acid of the desoxyribose type.

Added to the transformation system this type-specific desoxyribonucleic acid is apparently adsorbed by the unencapsulated R cells. Here it functions as an ingrafted gene (or specificity determinant) causing recapsulation of the coccus, with polysaccharides of type III specificity. Like previously present genes the ingrafted nucleic acid increases (or is increased) in amount with the multiplication of the recapsulated cells. It thus functions as an heritable genetic character through innumerable test tube generations or animal passages.

No definite theory as to the mechanism of this transformation is thus far suggested by the Rockefeller Institute biochemists. They do call attention, however, to its implications in the fields of genetics, virology and cancer research. Their findings, therefore, are not only of clinical interest, but of basic importance in many other fields of biological research.

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#### A Letter from an Over-Seas Physician. On Interest of Military Colleagues Concerning Medical Trends.

(COPY)

Dear Doctor Kress:

No doubt you will be surprised to hear from a G. I. Medical Officer in an overseas field unit. I read with much interest your discussion of the Federal Maternity and Child Care Plan in the January 15th *J.A.M.A.* The average doctor doesn't realize what an enormous effect such practices may have on the future course of American Medicine.

Although not a Californian by birth, I lived there while on army duty for two years before coming overseas. Speaking as one who plans to return there after the war, I am much in favor of your efforts to combat regimentation of the medical profession by such plans. I was also interested in your analysis of Kaiser's prepaid medical service plan. Such plans, as you so ably pointed out, work very well on select groups, but will not when all ages are brought in, or in rural areas.

Initiative on the part of the medical profession in formulating a plan for voluntary sickness insurance at this time, will be richly rewarded, I believe. Even though such a plan may not be widely adopted immediately, you will have something to point to and say,—"We have a sickness insurance plan."

Delay will allow the politicians to devise one which will probably be desirable only from their standpoint. Such was the case in Germany and England and the standard of medical care suffered as a consequence.

If anything has been accomplished by this war it is the vindication of free enterprise. It is what made possible the creation of the best trained and equipped army in the world in a short time. Also our present medical system made possible the super medical service through the enrollment of well-trained doctors. One thing the people should ask in considering any method of medical service is, "Will it attract a high type individual to the practice of medicine?"

The American people as a whole are pretty fair minded. If the facts in the case are presented to them in the proper manner they will usually choose the right road. I believe education of the people by the medical profession as to what they are getting in medical care now, and what they would get under socialized medicine is the answer to our problem.

Your attitude in your approach to these questions is encouraging to those of us overseas. Many of us have been in the army so long, nearly three years in my case, that we have nearly forgotten about private practice. If we return to some scheme of Federalized medicine, many of us will ask, "Was it worth it?" However, American Medicine has always been progressive and I feel confident that it will come through this time.

Keep up the good work that you have started and rest assured that the proceedings of your committee are followed with interest by all who are in the service. We'll be coming home some day anxious and willing to carry our share of the load.

Trusting that I have not been too presumptuous, I am,

Very sincerely,

(Signed) WARD M. COLE, CAPT., M.C.